

Before the
Federal Communications Commission
Washington, D.C. 20554

In re Matter of
FIBERTOWER, INC.
Petition for Waiver of Sections 101.103 and
101.115 of the Commission's Rules for the Use of
0.61 meter Antennas in the 10.7-11.7 GHz Band

ORDER

Adopted: June 6, 2006

Released: June 6, 2006

By the Acting Chief, Wireless Telecommunications Bureau:

I. INTRODUCTION

1. On October 22, 2004, FiberTower, Inc. (FiberTower) requested a waiver of the technical parameters in Sections 101.103 and 101.115 of the Commission's Rules that establish interference protection for operators in the 10.7 - 11.7 GHz (11 GHz) band. Specifically, the waiver would permit the use of 0.61 meter ("two-foot") antennas as an optional alternative to the 1.22 meter ("four-foot") antennas that meet the existing technical parameters for Fixed Microwave Service in the 11 GHz band. We grant the waiver for the reasons, and subject to the conditions, set forth below. We find that permitting the

1 FiberTower, Inc., Petition for Waiver Pending Rulemaking (filed Oct. 22, 2004) (Waiver Request); see also Letter from Mitchell Lazarus, Esq., Fletcher, Heald, and Hildreth, P.L.C., to Marlene H. Dortch, Secretary, FCC (filed Dec. 1, 2004) (First Ex Parte Letter); Letter from Mitchell Lazarus, Esq., Fletcher, Heald, and Hildreth, P.L.C., to Joel Taubenblatt, Chief, Broadband Division, Wireless Telecommunications Bureau, FCC (filed Dec. 22, 2004) (Second Ex Parte Letter); Letter from Mitchell Lazarus, Esq., Fletcher, Heald, and Hildreth, P.L.C., to John Schauble, Deputy Chief, Broadband Division, Wireless Telecommunications Bureau, FCC (dated June 24, 2005) (Third Ex Parte Letter) (identifying specific cases where FiberTower was unable to use the 11 GHz band to provide service because it could not install 0.61 meter antennas); Letter from Mitchell Lazarus, Esq., Fletcher, Heald, and Hildreth, P.L.C., to Marlene H. Dortch, Secretary, FCC (filed Oct. 24, 2005) (Fourth Ex Parte Letter).

2 47 C.F.R. §§ 101.103, 101.115.

3 See 47 C.F.R. § 101.115(b). The Commission's Rules, on their face, do not mandate a specific antenna size. Rather, they establish technical parameters that, given the current state of technology, translate to a certain size antenna.

4 In addition to its waiver request, FiberTower filed a request to initiate a rulemaking to change the technical parameters of Sections 101.103 and 101.115. See FiberTower, Inc., Petition for Rulemaking (filed July 14, 2004) (FiberTower Petition or Petition for Rulemaking). The rulemaking, Amendment of Part 101 of the Commission's Rules to Increase Spectrum Use Through More Flexible Antenna Rules for the 10.7 -11.7 GHz Band, has been docketed as RM-11043. See Consumer & Governmental Affairs Bureau Reference Information Center Petition for Rulemaking Filed, Public Notice, Report No. 2666 (July 23, 2004) (Rulemaking Public Notice). Our action in the instant Order is taken without prejudice to FiberTower's petition for rulemaking.

installation of 0.61 meter antennas in the 11 GHz band will facilitate the efficient and effective use of the spectrum while the conditions imposed herein will protect licensees operating in the band. In particular, the conditions shift the burden of addressing any interference issues arising from the use of 0.61 meter antennas to FiberTower. FiberTower also must include the terms and conditions of this waiver in any contracts related to the use of 0.61 meter antennas in the 11 GHz band. This action does not pre-judge the outcome of any related rulemaking proceeding and FiberTower assumes the risk of erecting 0.61 meter antennas in the 11 GHz band because it will be required to comply with the outcome of any related proceeding.

## II. BACKGROUND

2. FiberTower markets backhaul services primarily to mobile wireless carriers seeking a competitive alternative to traditional transport facilities, such as copper T-1s, for carrying traffic from cell sites to mobile switching centers.<sup>5</sup> FiberTower's current network architecture uses a combination of SONET fiber-optic rings and Digital Radio Links (DRLs). The DRLs use state-of-the-art, high-capacity, point-to-point microwave. The result is a dedicated backhaul network that uses a hub-and-spoke architecture of digital microwave radios connected to local fiber exchange points. FiberTower states that its backhaul service also could be used for new modes of residential and mobile broadband delivery – Broadband over Power Lines (BPL), fiber-to-the-curb (FTTC), and Advanced Wireless Services (AWS) – together with broadband Internet access for schools, businesses, and apartment buildings, and interconnection of industrial campuses.<sup>6</sup>

3. The 11 GHz band is allocated within the United States on a co-primary basis to the Fixed Services (FS), licensed under Part 101 of the Commission's Rules,<sup>7</sup> and to the Fixed Satellite Service (FSS), licensed under Part 25 of the Commission's Rules.<sup>8</sup> Specifically, in the United States, the 11 GHz band is used by the FS for Local Television Transmission Service (LTTS), Microwave Business, Microwave Public Safety, and Common Carrier Fixed Point-to-Point operations. Although the 11 GHz band is allocated internationally for FSS on a primary basis, the use of the FSS downlink band at 11 GHz is limited, within the United States, to international systems, *i.e.*, other than domestic systems.<sup>9</sup> The Commission explained that the domestic allocation of the spectrum was more restrictive than the international allocation because of the need to protect and permit the growth of substantial incumbent FS operations and licensees.<sup>10</sup>

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<sup>5</sup> Waiver Request at 1 n.1. The term "backhaul" generally refers to the transport links that carry traffic and network control information between base stations and other network elements, primarily mobile switching centers.

<sup>6</sup> Waiver Request at 1.

<sup>7</sup> 47 C.F.R. Part 101.

<sup>8</sup> 47 C.F.R. Part 25. The 11 GHz band is used for geostationary satellite (GSO) operations, and the 10.7-10.95 GHz and 11.2-11.45 GHz portion of the spectrum is designated as a planned band under Appendix 30B of the International Telecommunications Union (ITU) rules. This means that this segment of the band is an internationally "planned band" where each country is assigned frequencies at certain orbital locations in the geostationary orbital arc.

<sup>9</sup> See 47 C.F.R. § 2.106, NG104 (stating that "[t]he use of the bands 10.7-11.7 GHz (space to Earth)...by the fixed satellite service in the geostationary-satellite orbit shall be limited to international systems, *i.e.*, other than domestic systems").

<sup>10</sup> See, *e.g.*, Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ku-Band, IB Docket No. 01-96, *Notice of Proposed Rulemaking*, 16 FCC Rcd 9680, 9684 ¶ 10 (2001 *NGSO NPRM*).

4. FiberTower seeks a waiver of the technical parameters in Sections 101.103 and 101.115 of the Commission’s Rules<sup>11</sup> in order to permit the use of smaller antennas to provide FS in the 11 GHz band. Specifically, FiberTower proposes to operate in accordance with the technical specifications set forth in the following table:<sup>12</sup>

Frequency (MHz)	Category	Maximum beam-width to 3 dB pts	Minimum antenna Gain (dBi)	Minimum radiation suppression to angle in degrees from centerline of main beam in decibels						
				5° to 10°	10° to 15°	15° to 20°	20° to 30°	30° to 100°	100° to 140°	140° to 180°
10,700-11,700	A	3.5	33.5	18	24	28	32	35	55	55
	B	3.5	33.5	17	24	28	32	35	40	45

5. According to FiberTower, mobile wireless carriers typically have to expand their backhaul capacity in tandem with any expansion of network capacity. As carriers add cell sites, split cell sites or add data-intensive third-generation wireless services, they also must increase transport capacity to accommodate higher traffic levels.<sup>13</sup> FiberTower contends that use of the 1.22 meter antennas currently permitted in the 11 GHz band is prohibited or impractical at many of its customers’ cell site locations primarily because of zoning regulations and tower loading limitations. It asserts that a waiver permitting it to use smaller, lighter 0.61 meter antennas in the 11 GHz band will allow it to offer service to its customers at sites where such a choice is not available today.<sup>14</sup>

6. FiberTower contends that grant of the instant waiver request “will yield . . . benefits . . . arising from the antennas’ lower cost, smaller size, and capability for making better use of spectrum.”<sup>15</sup> First, FiberTower argues that small antennas cost less to manufacture, distribute, install, and maintain.<sup>16</sup> Second, FiberTower explains that the modest size and weight of the 0.61 meter antenna provide a practical installation solution at sites that are otherwise incapable of supporting large antennas.<sup>17</sup> According to FiberTower, this flexibility allows for the inexpensive last-mile delivery of broadband service to locations that are otherwise prohibitively expensive or impossible to reach with broadband

<sup>11</sup> 47 C.F.R. §§ 101.103, 101.115.

<sup>12</sup> Waiver Request at 8; *see also id.*, Appendix, Table 1. The technical specifications are the same as those proposed in the rulemaking proceeding. *See* FiberTower Corp., Petition for Rulemaking, RM-11043, Amendment of Part 101 of the Commission’s Rules to Increase Spectrum Use Through More Flexible Antenna Rules for the 10.7 – 11.7 GHz Band (filed July 14, 2004). As explained in footnote 3, *supra*, the Commission’s Rules do not specifically dictate a certain antenna size. Because the application of the technical parameters specified in the Commission’s Rules effectively limits FiberTower to a 1.22 meter antenna, we do, throughout this *Order*, refer to the Commission’s Rules as “requiring” a 1.22 meter antenna and as the waiver request seeking a decision “permitting” a 0.61 meter antenna.

<sup>13</sup> *See* Second *Ex Parte* Letter; Gupta Letter at 1-2.

<sup>14</sup> *See* Second *Ex Parte* Letter at 1; Gupta Letter at 1-2.

<sup>15</sup> Waiver Request at 5.

<sup>16</sup> *Id.* at 2-3, 6. FiberTower cites the current list price of a small antenna as being one-third the cost of an otherwise comparable 1.22 meter antenna. *Id.* at 3, 6.

<sup>17</sup> *See id.* at 7.

radio.<sup>18</sup> Third, FiberTower proposes that the optional use of small, 0.61 meter antennas in the 11 GHz band will promote the efficient use of the spectrum. FiberTower contends that FS licensees have a special need for flexibility in the use of their spectrum because the Commission has reallocated FS spectrum to other services in recent years and because the new spectrum available to FS is suitable only for short-range applications.<sup>19</sup>

7. FiberTower asks the Commission to recognize the urgency of its need to use 0.61 meter antennas in the 11 GHz band.<sup>20</sup> Although FiberTower contends that the use of microwave facilities in the 11 GHz band would be an ideal solution for many customers, it argues that, as discussed above, the difficulty of siting and mounting the 1.22 meter antennas currently required under the Commission's Rules discourages wireless backhaul providers from making better use of the band.<sup>21</sup> Indeed, in an *ex parte* filing, dated June 24, 2005, FiberTower claimed that it has identified well over a hundred locations where it was precluded from using the 11 GHz band to provide service due to its inability to deploy a 1.22 meter antenna at those locations.<sup>22</sup> For example, in Lewisville and San Antonio, Texas and Akron and Westlake, Ohio, FiberTower could not use a 1.22 meter antenna because the towers in question failed structural analyses.<sup>23</sup> In other examples, such as in Boston and Westford, Massachusetts, Dallas, Arlington, Plano, Grand Prairie, and Southlake, Texas, and Queens, Brooklyn, and Bronx, New York, FiberTower encountered zoning and aesthetic restrictions varying from the categorical prohibition of the use of any antennas exceeding 0.91 meter (thirty-six inches) in diameter to having to submit to a lengthy and uncertain zoning process in an attempt to obtain a variance for the use of an antenna exceeding 0.91 meter (thirty-six inches) in diameter.<sup>24</sup> In each instance, FiberTower opted to redesign the network to use a 0.61 meter antenna in another microwave band, such as the 10 GHz or 18 GHz bands.<sup>25</sup> Often, FiberTower found that its inability to employ a smaller antenna for use in the 11 GHz band resulted in a

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<sup>18</sup> *Id.* at 3, 7. In addition, FiberTower observes that the smaller antennas are also less esthetically objectionable, thereby facilitating compliance with restrictions imposed by local zoning laws and homeowner association codes. *Id.* at 3, 7.

<sup>19</sup> *Id.* at 8. Specifically, FiberTower argues that the need to relocate the FS licensees from spectrum assigned to other services has placed great pressure on the remaining FS bands capable of handling reasonably long links (*i.e.*, the 4, 6, 11, 18, and 23 GHz bands). *Id.* at 8. FiberTower notes that the use of high-frequency microwave bands (*i.e.*, the 18, 23, 24, and 39 GHz bands) is impractical in large parts of the country for anything other than short links because of rain fade and that the use of low-frequency microwave bands (*i.e.*, the 4 and 6 GHz bands) is difficult to frequency-coordinate in heavily populated areas where demand for backhaul is greatest. *See* Gupta Letter at 1. Moreover, with respect to the 18 GHz and 23 GHz bands, FiberTower contends that scant spectrum remains available in the former after the Commission's recent reallocation and that Federal government installations in the latter limit private use. Waiver Request at 8.

<sup>20</sup> *See* Second *Ex Parte* Letter; Third *Ex Parte* Letter (identifying specific locations where FiberTower was precluded from using the 11 GHz band to provide service because the Commission's Rules would not permit it to install 0.61 meter antennas); *see also* Fourth *Ex Parte* Letter.

<sup>21</sup> *See* Gupta Letter at 2.

<sup>22</sup> *See* Third *Ex Parte* Letter at 1-2; *see also* Third *Ex Parte* Letter, Attachment (Table of "Representative FiberTower Locations Limiting 4-Foot Antennas"). FiberTower therein provided the Wireless Telecommunications Bureau (WTB) with a dozen representative instances. *See id.*

<sup>23</sup> *See id.* The loading was too high with a 1.22 meter antenna. *Id.*

<sup>24</sup> *See id.* In yet other examples, the rental costs for using a 1.22 meter antenna were 2 and ½ times greater than that for a 0.61 meter antenna. *See id.* (noting Akron and Chardon, Ohio and Waco, Texas).

<sup>25</sup> *See id.*

delay of three to six months while the system was redesigned.<sup>26</sup> Moreover, the reconfiguration of the system for use in the 10 GHz or 18 GHz band affected the quality and cost of service by relying on a lower capacity solution or requiring the installation of more links to cover the same path length.<sup>27</sup> According to FiberTower, the instant waiver request would have provided an alternative antenna choice for the 11 GHz band and eliminated the related costs and delays in service.

8. FiberTower pleads that it is in the public interest for the Commission to immediately authorize 0.61 meter antennas in the 11 GHz band because FiberTower proposes three conditions to “eliminate any downside risk.”<sup>28</sup> First, FiberTower proposes the following frequency coordination requirements that would ensure that, in using 0.61 meter antennas, FiberTower cannot cause greater interference or claim greater interference protection as compared to its use of 1.22 meter antennas:<sup>29</sup>

(a) A licensee or prior applicant using an antenna under the waiver may object to a prior coordination notice (i) only if it has actual grounds to object because of predicted interference, and (ii) only to the extent it would have grounds to object if it were using a compliant (non-waivered) antenna at the same site, polarization, frequency, bandwidth, and orientation.

(b) A Fixed Service applicant attempting to frequency coordinate a non-waivered antenna, or an applicant for a Fixed Satellite Service earth station, that predicts received interference from a licensee or prior applicant using an antenna under the waiver, can require the licensee or prior applicant to reduce the predicted interference to levels no higher than would be predicted from a compliant (non-waivered) antenna, within the current frequency coordination time limits.<sup>30</sup>

Second, FiberTower explains that licensees and users permitted to erect a 0.61 meter antenna for use in the 11 GHz band by authority of the waiver “must comply with the outcome of proceeding RM-11043 and any related rulemaking.”<sup>31</sup> Finally, FiberTower agrees to include the terms of these conditions in any customer contracts that entail the use of antennas pursuant to this waiver request.<sup>32</sup> In addition, we note FiberTower’s statement that it will install a maximum of 500 antennas per year under the waiver and, as to each antenna, will maintain records of the licensee, call sign, and station location.<sup>33</sup>

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<sup>26</sup> *See id.*

<sup>27</sup> *See id.* In addition, with regard to provision of service in Boston, Massachusetts, the redesign of the network has caused FiberTower to install more aggregation points and incur higher fiber circuit costs. *Id.*

<sup>28</sup> Waiver Request at 8.

<sup>29</sup> *Id.* at 9.

<sup>30</sup> *Id.* at 9.

<sup>31</sup> *Id.* at 8. FiberTower specifically accepts “the risk that the Commission may decline to authorize, or may impose conditions on, antennas smaller than 4 feet. Absent authorization to the contrary, licensees may have to retrofit or remove antennas to achieve compliance.” *Id.* at 9.

<sup>32</sup> *Id.* at 10.

<sup>33</sup> *Id.* at 10. FiberTower will also include the terms and conditions of the waiver in any contracts related to the use of 0.61 meter antennas in the 11 GHz band pursuant to the waiver. *Id.* at 10.

9. On January 19, 2005, the Wireless Telecommunications Bureau (WTB) released a public notice seeking comment on the waiver request.<sup>34</sup> A number of parties filed comments, reply comments, and *ex parte* letters in response to the *Public Notice*.<sup>35</sup> Among the ten comments and *ex parte* letters that we received in support of FiberTower's waiver request, six comments, one of which was filed *ex parte*, were submitted by equipment manufacturers,<sup>36</sup> two comments were submitted by associations representing various segments of the fixed microwave community,<sup>37</sup> including licensees and equipment manufacturers, one comment was filed by a frequency coordinator,<sup>38</sup> and one *ex parte* letter was filed by a wireless carrier.<sup>39</sup> In opposition, we received comments from a satellite provider and from an association representing the satellite industry.<sup>40</sup> We address the comments in our discussion below.

### III. DISCUSSION

10. Section 1.925 of the Commission's Rules<sup>41</sup> provides that a waiver of the Commission's Rules may be granted if it is shown that either (1) the underlying purpose of the rule(s) would not be served or would be frustrated by application to the instant case, and that a grant of the requested waiver would be in the public interest; or (2) in view of the unique or unusual circumstances of the instant case, application of the rule(s) would be inequitable, unduly burdensome or contrary to the public interest, or the applicant has no reasonable alternative.<sup>42</sup> For the reasons discussed below, we conclude that FiberTower has justified a waiver of Section 101.115(b) of the Commission's Rules pursuant to the second prong of the waiver standard, subject to the conditions set forth herein.

11. Section 101.115(b) of the Commission's Rules establishes technical standards to avoid interference for operators in the 11 GHz band.<sup>43</sup> Although the rule on its face does not mandate a specific

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<sup>34</sup> Wireless Telecommunications Bureau Seeks Comment on FiberTower, Inc. Request for Waiver of Sections 101.103 and 101.115 of the Commission's Rules to Permit the Use of 0.61 Meter Antennas in the 10.7 – 11.7 GHz Band, *Public Notice*, DA 05-114, 20 FCC Rcd 1383 (WTB 2005) (*Public Notice*).

<sup>35</sup> See Alcatel, Comments (filed Feb. 3, 2005); Ceregon Networks, Inc., Comments (filed Feb. 3, 2005); Comsearch, Comments (filed Feb. 3, 2005); EchoStar Satellite, L.L.C., Comments (filed Feb. 3, 2005); Fixed Wireless Communications Coalition, Comments (filed Feb. 3, 2005); Harris Corporation, Comments (filed Feb. 3, 2005); NEC Corporation, Comments (filed Feb. 3, 2005); Satellite Industry Association, Petition to Deny (filed Feb. 3, 2005) (SIA PTD); Stratex Networks, Inc., Comments (filed Feb. 3, 2005); Wireless Communications Association International, Inc., Comments (filed Feb. 3, 2005); FiberTower, Inc., Reply Comments (filed Feb. 14, 2005). In addition, prior to the release of the *Public Notice*, Cingular Wireless filed an *ex parte* letter in support of FiberTower's waiver request. See Letter from Michael E. McCormick, Program Manager, Cingular Wireless, to Magalie Salas, Secretary, FCC (filed Jan. 12, 2005; dated Dec. 15, 2004) ("Cingular Letter"). An additional *ex parte* letter was filed by DragonWave, Inc. on May 30, 2005. Dragonwave, Inc., *Ex Parte* Comments (dated May 30, 2005) (DragonWave *Ex Parte* Comments).

<sup>36</sup> See Alcatel Comments; Ceregon Comments; Harris Comments; NEC Comments; Stratex Comments; see also FiberTower Reply Comments; DragonWave *Ex Parte* Comments.

<sup>37</sup> See FWCC Comments; WCAI Comments.

<sup>38</sup> See Comsearch Comments.

<sup>39</sup> See Cingular Letter.

<sup>40</sup> See EchoStar Comments; SIA PTD.

<sup>41</sup> 47 C.F.R. § 1.925.

<sup>42</sup> *Id.*; see also *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969), *aff'd*, 459 F.2d 1203 (1972), cert. denied, 409 U.S. 1027 (1972).

<sup>43</sup> 47 C.F.R. § 101.115(b).

size of antenna, it does specify certain technical parameters that, given the current state of technology, limit operators to a minimum size of 1.22 meters. FiberTower proposes changes to those parameters that would allow antennas with reduced mainbeam gain, increased beamwidth, and reduced sidelobe suppression and, as a result, would allow use of smaller, 0.61 meter antennas.<sup>44</sup>

12. We find, based on the circumstances presented in this proceeding, that a grant of the instant waiver would result in a better implementation of Commission policy. We agree that the instant waiver will permit the immediate deployment of 0.61 meter antennas in the 11 GHz band, thereby increasing the number of sites available for 11 GHz backhaul.<sup>45</sup> Specifically, the installation of 0.61 meter antennas in the 11 GHz band, pursuant to terms and conditions set forth herein, will facilitate the use of the 11 GHz band while providing interference requirements and procedures to appropriately protect licensees operating in the band. As such, the more intensive use of the 11 GHz band pursuant to the instant waiver is consistent with the Commission's objective of promoting the efficient and effective use of spectrum.

13. We find that a denial of the instant waiver would be unduly burdensome on FiberTower and contrary to the public interest. SIA contends that FiberTower has failed to present special circumstances to justify a waiver of the Commission's Rules.<sup>46</sup> According to SIA, FiberTower has failed to demonstrate a nexus between its claim that there are locations where the use of 1.22 meter antennas is impractical and its request to install 500 antennas per year pursuant to a waiver of the rule.<sup>47</sup> We disagree. In particular, we note that FiberTower has provided a list of specific locations where the Commission's current technical rules impede its ability to provide service.<sup>48</sup> Absent a waiver, FiberTower must delay the deployment of 11 GHz service, including 2G and 3G services, to wireless operators in many areas or reconfigure, at a significant cost, its system to use another microwave band.<sup>49</sup> Specifically, the majority of the towers that were analyzed as possibilities for the placement of FiberTower's antennas "have been near their design capacity and they will not support a 1.22 meter diameter dish."<sup>50</sup> Although, in some instances, towers may be upgraded to accommodate 1.22 meter antennas, the task is costly, time-consuming, and often impractical.<sup>51</sup> Indeed, FiberTower has identified well over a hundred locations

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<sup>44</sup> See Waiver Request, Appendix, Table 1.

<sup>45</sup> See, e.g., WCAI Comments at 2; see also Cingular Letter at 1; FWCC Comments at 1-2.

<sup>46</sup> See SIA PTD.

<sup>47</sup> SIA PTD at 7.

<sup>48</sup> See Third *Ex Parte* Letter.

<sup>49</sup> Gupta Letter at 1. Denver, Washington, Houston, Florida, Boston, Cleveland, Detroit, San Antonio, Austin, Waco, New York, and New Jersey are among those areas where FiberTower had a demand to provide service but was either significantly delayed or forced to reconfigure its system for use in another microwave band. See Third *Ex Parte* Letter (identifying specific locations where FiberTower was unable to use the 11 GHz band to provide service).

<sup>50</sup> Letter from Mr. Edgardo P. Brandao, P.E., Project Manager, Hunt & Joiner, Inc., to Mitchell Lazarus, Esq., Fletcher, Heald, and Hildreth, PLC (dated Dec. 21, 2004) ("Brandao Letter") (Mr. Brandao performs the structural analyses at prospective antenna sites for FiberTower). According to FiberTower, a 0.61 meter antenna is only one-fourth the dish area of the 1.22 meter antenna. Waiver Request at 7. Moreover, FiberTower notes that the 0.61 meter antennas generally weigh about thirty-five pounds, whereas the 1.22 meter antennas weigh approximately 125 pounds. See *id.*; see also Brandao Letter at 1. Mr. Brandao also notes that the use of smaller antennas results in less stress on the tower, including that caused by wind-loading. See *id.*

<sup>51</sup> See Letter from Bob T. Paswalk, Manager Construction Services, Andrew Systems, Inc., to Tarun Gupta, Chief Architect, FiberTower, Inc. (dated Nov. 11, 2004) ("Paswalk Letter") (filed as an attachment to the Second *Ex Parte* Letter).

where it could have used the 11 GHz band to provide service if the technical parameters set forth in Section 101.115(b) of the Commission's Rules were modified to permit the use of smaller antennas.<sup>52</sup> We therefore believe that, by granting FiberTower a limited waiver, the lower costs associated with 0.61 meter antennas will result in the immediate deployment of fixed microwave facilities in the 11 GHz band.<sup>53</sup> Indeed, we expect that FiberTower's deployment of 0.61 meter antennas in the 11 GHz band pursuant to the instant waiver will facilitate the provision of conventional voice services and the roll-out of 3G services in the near term while appropriately protecting other users in the band from interference.<sup>54</sup> The instant waiver will thereby promote the efficient use of the spectrum by allowing FiberTower the flexibility to install 0.61 meter antennas in the 11 GHz band to provide for a wide range of fixed microwave applications that are not currently being provided for in the 11 GHz band for both financial and aesthetic reasons.

14. Many of the commenting parties that support FiberTower's waiver request agree that the use of smaller antennas will reduce the cost of providing 11 GHz links due to the lower initial purchase cost of 0.61 meter antennas as well as lower installation, mounting, and maintenance costs.<sup>55</sup> In addition, a number of commenting parties also agree with FiberTower that the smaller size and more modest weight of 0.61 meter antennas will invite the installation of antennas at sites incapable of supporting 1.22 meter antennas.<sup>56</sup> Specifically, Ceregon, NEC, and WCAI contend that, in comparison to the 1.22 meter antennas, 0.61 meter antennas require less structural support and are subject to less wind load.<sup>57</sup> Moreover, commenting parties also emphasize that the use of small, 0.61 meter antennas in the 11 GHz band will promote the efficient use of the spectrum.<sup>58</sup> NEC, for example, contends that FS licensees have a special need for flexibility in the use of their spectrum because the Commission has reallocated FS spectrum to other services in recent years and because the new spectrum available to FS is suitable only for short-range applications.<sup>59</sup> Ceregon notes that the 11 GHz band is also less susceptible to rain attenuation than higher frequency systems which allow for the use of 0.61 meter antennas.<sup>60</sup>

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<sup>52</sup> See Third *Ex Parte* Letter at 1-2; see also Third *Ex Parte* Letter, Attachment (Table of "Representative FiberTower Locations Limiting 4-Foot Antennas"). FiberTower therein provided the WTB with a dozen representative instances. See *id.*

<sup>53</sup> See also, e.g., FWCC Comments at 1-2; Harris Comments at 2; Ceregon Comments at 1-2.

<sup>54</sup> See Cingular Letter at 1; see also FWCC Comments at 1-2; NEC Comments at 1-2.

<sup>55</sup> See, e.g., Ceregon Comments at 1-2; FWCC Comments at 1-2; Harris Comments at 2; NEC Comments at 2. NEC emphasizes that 0.61 meter antennas are only one-third the cost of the 1.22 meter antennas presently required. See NEC Comments at 2.

<sup>56</sup> See, e.g., Ceregon Comments at 2; FWCC Comments at 1-2; NEC Comments at 1; WCAI Comments at 1-2. According to Cingular, many towers and rooftops in Cingular's system cannot support a 1.22 meter antenna, but they could accommodate a 0.61 meter antenna. Cingular Letter at 1.

<sup>57</sup> See Ceregon Comments at 1-2; NEC Comments at 2; WCAI Comments at 2. Specifically, WCAI notes that the larger antennas produce a "sail area" of over twelve square feet, thereby resulting in very substantial wind loads. WCAI Comments at 2.

<sup>58</sup> See, e.g., NEC Comments at 1; Harris Comments at 1-2; Ceregon Comments at 1-2.

<sup>59</sup> NEC Comments at 1. According to Harris, the 11 GHz band offers a wide selection of channel bandwidths that provide superior propagation characteristics than the 18 GHz and 23 GHz bands. Harris Comments at 2. Specifically, Harris argues that the 11 GHz band is an excellent alternative for those FS users forced to relocate from the 18 GHz band. See *id.* In addition, Harris also contends that federal government licensing procedures often impede the timely licensing of commercial systems in the 23 GHz band. See *id.*

<sup>60</sup> Ceregon Comments at 1-2.

15. We recognize that the use of smaller, lower-gain antennas will result in more radiofrequency energy being transmitted in directions away from the actual point-to-point link.<sup>61</sup> However, after careful consideration of the full record in this proceeding, we conclude that FiberTower can effectively address interference concerns by complying with conditions that shift any interference coordination disadvantage to itself as the small antenna user, thereby making a FiberTower's use of a small antenna of no significant consequence to other users of the band. Although SIA raised certain interference concerns in the rulemaking proceeding, we note that FiberTower specifically revised the proposed rule in that proceeding to make it explicitly clear that there was no change in the interference protection extended to satellite earth station applicants.<sup>62</sup> EchoStar generally asserts that, even if FiberTower's nonconforming operations are subject to an obligation not to cause interference to authorized satellite operations, our grant of the requested waiver will create a much more difficult sharing situation between FS and FSS in the 11 GHz band.<sup>63</sup> We find that such a generalized prediction is insufficient to justify a denial of the waiver on the basis of the record in this proceeding. In weighing the benefits of granting the waiver against the possible harm to the interference environment, we find that the conditions which FiberTower has agreed to place on its use of 0.61 meter antennas represent a reasonable approach to allowing the benefits of smaller antennas<sup>64</sup> while making FiberTower fully responsible for potential interference in those specific instances where the smaller antenna does not provide similar discrimination values as a compliant antenna.<sup>65</sup> According to Comsearch, "such procedures are well understood by the coordination community and are easily implemented."<sup>66</sup> We hereby adopt those conditions as clarified in this *Order*.

16. We recognize that the 11 GHz band is shared on a co-primary basis with the FSS. However, we disagree with SIA that the shared nature of the 11 GHz band precludes us from granting FiberTower the requested relief. To date, the use of the 11 GHz band by the FSS, within the United States, has been limited because the Commission has repeatedly emphasized the need to protect the use and expansion of terrestrial microwave services within the band.<sup>67</sup> We therefore disagree with SIA's contention that the

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<sup>61</sup> This is due not only to the relaxed radiation suppression on angles away from the centerline of the main beam, but also because users of 0.61 meter antennas will have to transmit with approximately 4.5 dB more power in order to overcome the reduced main beam gain.

<sup>62</sup> See SIA, Comments, RM-11043, Amendment of Part 101 of the Commission's Rules to Increase Spectrum Use Through More Flexible Antenna Rules for the 10.7 – 11.7 GHz Band (filed Aug. 23, 2004); FiberTower, Reply Comments, RM-11043, Amendment of Part 101 of the Commission's Rules to Increase Spectrum Use Through More Flexible Antenna Rules for the 10.7 – 11.7 GHz Band (filed Sept. 7, 2004). FiberTower incorporated the same revised language in the proposed conditions that we are placing upon our grant of the instant waiver. SIA did not raise similar objections in this proceeding. See SIA PTD.

<sup>63</sup> See EchoStar Comments at 2-4.

<sup>64</sup> The Commission has previously recognized that many fixed microwave users need or prefer to employ small antennas because most potential antenna sites, such as rooftops, monopoles, and electrical transmission towers, cannot support large microwave dishes, due to either space limitations or aesthetic objections of homeowner associations or zoning boards. Amendment of Part 101 of the Commission's Rules to Streamline Processing of Microwave Applications in the Wireless Telecommunications Services, *Report and Order*, 17 FCC Rcd 15040 ¶ 76 (2002) (*2002 Part 101 Streamlining Report and Order*) (amending the Commission's Rules to permit the use of antennas smaller than 1.22 meters (four-feet) in diameter in the 10 GHz band). Indeed, the Commission therein found that the benefits of smaller antennas in terms of aesthetics and structure loading are undeniable. See *id.*

<sup>65</sup> See, e.g., Comsearch Comments at 2.

<sup>66</sup> Comsearch Comments at 2.

<sup>67</sup> See, e.g., Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ku-Band, IB Docket No. 01-96, *Notice of Proposed Rulemaking*, 16 FCC Rcd 9680, 9694 ¶ 45 (2001 *Ku-Band NGSO NPRM*) (explaining that the Commission restricted NGSO FSS earth station usage in frequency (continued...))

current rules prevent FS and FSS from proliferating in the 11 GHz band to the exclusion of the other by *effectively* limiting the deployment of FS and FSS stations.<sup>68</sup> The Commission's intent and effect in adopting footnote NG104 was to limit the expansion of FSS in the 11 GHz band and protect the future use of the band for FS.<sup>69</sup> However, the technical specifications that limit the size of the FS antennas employed in the 11 GHz band were not adopted by the Commission to "counterbalance" against the growth of the FS in the 11 GHz band. Rather, antenna standards exist for the purpose of promoting the use of the most discriminating equipment to facilitate the introduction of new transmission paths. When the Commission adopted the instant antenna specifications, the parameters were based on the technical sophistication of the communications equipment and the needs of the various users of the band at the time. Indeed, the Commission adopted similar technical specifications that effectively limited the size of antennas used in other bands,<sup>70</sup> including those used by satellite.<sup>71</sup> However, the Commission has since

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spectrum bands shared with terrestrial operations "to avoid ubiquitous deployment of NGSO FSS earth stations in shared bands, thereby allowing the continued use and growth of terrestrial operations in those bands."); Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the KU-Band Frequency Range, ET Docket No. 98-206, RM-9147, *First Report and Order and Further Notice of Proposed Rulemaking*, 16 FCC Rcd 10084 (2000) (noting that the Commission sought to ensure that NGSO FSS operations do not cause unacceptable interference to existing users and do not unduly constrain future growth of incumbent services); Inquiry Relative to Preparation for a General World Administrative Radio Conference of the International Telecommunications Union to Consider Revision of the International Radio Regulations, Docket No. 20271, *Report and Order*, 70 FCC Rcd 1193, ¶¶ 189-191 (1978) (expressing concern that the 11 GHz band is shared quite extensively with terrestrial services in the United States, envisioning that the number of fixed-satellite earth stations would be limited to about half a dozen stations, located in places far from population centers, so as not to restrict unduly the further development of terrestrial services, and explicitly rejecting allowing the bi-directional use of the 11 GHz band by the FSS because it "would severely restrict the development of the terrestrial fixed service, especially the utilization of digital techniques."); Amendment of Part 2 of the Commission's Rules to Conform, to the Extent Practicable, with the Geneva Radio Regulations, as Revised by the Space Warc, Geneva, 1971, Docket No. 19547, *Report and Order*, 39 FCC 2d 959 (1973) (expressing intent to protect microwave use of the 11 GHz band).

<sup>68</sup> SIA PTD at 4. SIA concedes that, on the one hand, the Commission's Rules explicitly limit satellite use of the 11 GHz band to international systems. SIA PTD at 4 (*citing* 47 C.F.R. § 2.106, NG104). NG104 specifies that satellite use of the 11 GHz band is limited to international systems. *See* 47 C.F.R. § 2.106, NG104. However, SIA contends that, on the other hand, the Commission's Rules also have the *effect* of limiting FS station deployment by not permitting FS users to install antennas that are less than 1.22 meters. SIA PTD at 4.

<sup>69</sup> *See* 47 C.F.R. § 2.106, NG104 (stating that "[t]he use of the bands 10.7-11.7 GHz (space to Earth)...by the fixed satellite service in the geostationary-satellite orbit shall be limited to international systems, *i.e.*, other than domestic systems"). The Commission has found that the original intent of this footnote was to protect future FS growth by limiting the wide proliferation of FSS earth stations. *See, e.g.*, Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Band and 14.0-14.5 GHz/11.7-12.2 GHz Bands, IB Docket No. 02-10, *Report and Order*, 20 FCC Rcd 674, 710-11 ¶ 86 (2005); *see also* Service Rules and Procedures to Govern the Use of Aeronautical Mobile Satellite Service Earth Stations in Frequency Bands Allocated to the Fixed Satellite Service, IB Docket No. 05-20, *Notice of Proposed Rulemaking*, 20 FCC Rcd 2906, 2916-17 ¶ 18 (2005) (same).

<sup>70</sup> *See, e.g.*, Reorganization and Revision of Parts 1, 2, 21, and 94 of the Rules to Establish a New Part 101 Governing Terrestrial Microwave Fixed Radio Services, *Memorandum Opinion and Order and Notice of Proposed Rulemaking*, WT Docket 94-148, 15 FCC Rcd 3129 (2000) (*Part 101 MO&O and NPRM*) (seeking comment on permitting smaller antennas in the 10 GHz band).

<sup>71</sup> *See, e.g.*, Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the KU-Band Frequency Range, ET Docket No. 98-206, *Second Memorandum Opinion and Order*, 18 FCC Rcd 10,084 (2003) (*2003 NGSO Second MO&O*).

reconsidered many of those antenna specifications in light of the technological evolution of communications equipment.<sup>72</sup> Moreover, we believe that it is in the public interest to facilitate the use of the 11 GHz band while providing interference requirements and procedures to appropriately protect licensees operating in the band. We view allowing more intensive FS use of the 11 GHz band as consistent with the Commission's objective of promoting "the efficient and effective use of spectrum."<sup>73</sup>

17. We disagree with EchoStar and SIA that granting the waiver request would constitute a *de facto* rule change that the Commission should not permit without the benefit of thoroughly examining the underlying policies of the rule in a formal rulemaking proceeding.<sup>74</sup> SIA believes that granting the waiver request would amount to a *de facto* rule change because, by the time the Commission were to act on the related rulemaking, FiberTower, as well as those competitors of FiberTower that will likely seek similar waivers, may have installed thousands – and even tens of thousands – of antennas pursuant to waivers. We emphasize that our decision to grant FiberTower a waiver is based upon FiberTower's showing that it has an immediate need to deploy smaller antennas in the 11 GHz band in order to provide its services.<sup>75</sup> Moreover, we explicitly find that our action does not prejudge the action the Commission may take on FiberTower's petition for rulemaking.

18. Indeed, in order to protect against unanticipated problems from FiberTower's operations under the waiver, we have herein imposed strict limitations and requirements on FiberTower's authority to install and maintain 0.61 meter antennas in the 11 GHz band. FiberTower assumes the risk of erecting 0.61 meter antennas in the 11 GHz band because it will be required to comply with the outcome of the related rulemaking proceeding. Furthermore, FiberTower must comply with the following conditions that shift the burden of addressing any interference issues arising from the use of 0.61 meter antennas to itself:

- (a) A licensee or prior applicant using an antenna under the waiver may object to a frequency coordination notice (i) only if it has actual grounds to object because of predicted interference, and (ii) only to the extent it would have grounds to object if it were using a compliant (non-waivered) antenna at the same site, polarization, frequency, bandwidth, and orientation, and EIRP.
- (b) At any time, a Fixed Service applicant attempting to frequency coordinate a non-waivered antenna, or an applicant for a Fixed Satellite Service earth station, that predicts

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<sup>72</sup> See, e.g. Amendment of Part 101 of the Commission's Rules to Streamline Processing of Microwave Applications in the Wireless Telecommunications Services, WT Docket 00-19, *Report and Order*, 17 FCC Rcd 15,040 (2002) (*2002 Part 101 R&O*) (adopting smaller antennas for 10 GHz band); Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz / 3700-4200 MHz Band and 14.0-14.5 GHz / 11.7-12.2 GHz Bands, IB Docket No. 02-10, *Report and Order*, 20 FCC Rcd 674 (2005).

<sup>73</sup> Federal Communications Commission Strategic Plan 2006-2011 at 10.

<sup>74</sup> EchoStar Comments at 3; SIA PTD at 4-5.

<sup>75</sup> We also note that FiberTower has committed itself to limiting the number of antennas erected pursuant to the instant waiver to no more than 500 per year. See Waiver Request at 10. While we do not believe that this limitation is necessary to protect other licensees operating in the band, this commitment will make it easier for FiberTower to comply with any possible outcome in the related rulemaking. We clarify that an antenna shall be deemed installed and placed into use on the date that notification of completion of construction (FCC Form 601 and Schedule K) is filed for the station. FiberTower shall be limited to the installation of no more than 500 such antennas during each year beginning on the date that the first such antenna is installed pursuant to this waiver. When FiberTower wishes to construct a station pursuant to the grant of this waiver request, it shall specifically state in the application that the application is being filed pursuant to the waiver request. FiberTower shall not be required to pay waiver fees in connection with each application.

received interference from a licensee or prior applicant using an antenna under the waiver, can require the licensee or prior applicant to reduce the predicted interference to levels no higher than would be predicted from a compliant (non-waivered) antenna. The corrections required of the station operating under waiver to resolve the interference must be made within the frequency coordination time frame specified in Section 101.103(d)(2) of the Commission's Rules.<sup>76</sup>

In addition, we will require FiberTower to include the terms and conditions of the waiver in any customer contracts related to the use of 0.61 meter antennas in the 11 GHz band. We note that FiberTower has agreed to provide such notice to customers, and this condition is intended to ensure that FiberTower's customers are aware that service is being provided pursuant to a waiver that is subject to change.

#### IV. CONCLUSION AND ORDERING CLAUSES

19. We find, based on the circumstances presented in this proceeding, that FiberTower has demonstrated that a limited waiver of the technical parameters in Sections 101.103 and 101.115 of the Commission's Rules, 47 C.F.R. §§ 101.103, 101.115, is warranted to permit FiberTower to install no more than 500 0.61 meter antennas per year in the 11 GHz band in accordance with the conditions and requirements set forth in paragraph 18 of this *Order* and pursuant to the technical specifications enumerated in paragraph four of this *Order*.

20. Accordingly, IT IS ORDERED that pursuant to Section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Section 1.925 of the Commission's Rules, 47 C.F.R. § 1.925, the Request for Waiver Pending Rulemaking filed by FiberTower on October 22, 2004 IS GRANTED subject to the following terms and conditions:

- (a) All operations pursuant to this waiver shall be in compliance with the technical specifications set forth in paragraph four of this *Order*.
- (b) A licensee or prior applicant using an antenna under the waiver may object to a frequency coordination notice (i) only if it has actual grounds to object because of predicted interference, and (ii) only to the extent it would have grounds to object if it were using a compliant (non-waivered) antenna at the same site, polarization, frequency, bandwidth, and orientation, and EIRP.
- (c) At any time, a Fixed Service applicant attempting to frequency coordinate a non-waivered antenna, or an applicant for a Fixed Satellite Service earth station, that predicts received interference from a licensee or prior applicant using an antenna under the waiver, can require the licensee or prior applicant to reduce the predicted interference to levels no higher than would be predicted from a compliant (non-waivered) antenna. The corrections required of the station operating under waiver to resolve the interference must

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<sup>76</sup> 47 C.F.R. § 101.103(d)(2) specifies a two part coordination process involving notification and response. Notification involves a thirty day period, calculated from the receipt by the applicant, permittee, or licensee being notified.

be made within the frequency coordination time frame specified in Section 101.103(d)(2) of the Commission's Rules.<sup>77</sup>

(d) FiberTower must include the terms and conditions of the waiver in any customer contracts related to the use of 0.61 meter antennas in the 11 GHz band.

21. These actions are taken under delegated authority pursuant to Sections 0.131 and 0.331 of the Commission's Rules, 47 C.F.R. §§ 0.131, 0.331.

FEDERAL COMMUNICATIONS COMMISSION

Catherine W. Seidel  
Acting Chief, Wireless Telecommunications Bureau

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<sup>77</sup> 47 C.F.R. § 101.103(d)(2) specifies a two part coordination process involving notification and response. Notification involves a thirty day period, calculated from the receipt by the applicant, permittee, or licensee being notified.